

Mental Health Treatment Received by Youths in the Year Before and After a New Diagnosis of Bipolar Disorder

Mark Olfson, M.D., M.P.H.

Stephen Crystal, Ph.D.

Tobias Gerhard, Ph.D.

Cecilia S. Huang, Ph.D.

Gabrielle A. Carlson, M.D.

Objective: Despite a marked increase in treatment for bipolar disorder among youths, little is known about their pattern of service use. This article describes mental health service use in the year before and after a new clinical diagnosis of bipolar disorder. **Methods:** Claims were reviewed between April 1, 2004, and March 31, 2005, for 1,274,726 privately insured youths (17 years and younger) who were eligible for services at least one year before and after a service claim; 2,907 youths had new diagnosis of bipolar disorder during this period. Diagnoses of other mental disorders and prescriptions filled for psychotropic drugs were assessed in the year before and after the initial diagnosis of bipolar disorder. **Results:** The one-year rate of a new diagnosis of bipolar disorder was .23%. During the year before the new diagnosis of bipolar disorder, youths were commonly diagnosed as having depressive disorder (46.5%) or disruptive behavior disorder (36.7%) and had often filled a prescription for an antidepressant (48.5%), stimulant (33.0%), mood stabilizer (31.8%), or antipsychotic (29.1%). Most youths with a new diagnosis of bipolar disorder had only one (28.8%) or two to four (28.7%) insurance claims for bipolar disorder in the year starting with the index diagnosis. The proportion starting mood stabilizers after the index diagnosis was highest for youths with five or more insurance claims for bipolar disorder (42.1%), intermediate for those with two to four claims (24.2%), and lowest for those with one claim (13.8%). **Conclusions:** Most youths with a new diagnosis of bipolar disorder had recently received treatment for depressive or disruptive behavior disorders, and many had no claims listing a diagnosis of bipolar disorder after the initial diagnosis. The service pattern suggests that a diagnosis of bipolar disorder is often given tentatively to youths treated for mental disorders with overlapping symptom profiles and is subsequently reconsidered. (*Psychiatric Services* 60:1098–1106, 2009)

A recent sharp increase in the number of youths diagnosed as having bipolar disorder has focused attention on community practice patterns (1–4). Concern exists that a diagnosis of bipolar disorder may be excessively used by health care professionals who treat children and adolescents (5–7). A diagnosis of bipolar disorder may lead to the prescription of antipsychotic medications, and increasing evidence of adverse metabolic risks associated with these medications in youths (8,9), especially in combination with mood stabilizers (10), has only heightened public concern. Yet surprisingly little is known about the circumstances under which clinicians diagnose young people as having bipolar disorder and its implications for medication management. A better understanding of these issues would help provide a context to assess prevailing concerns over recent growth in the diagnosis of bipolar disorder among young people in community settings.

In carefully characterized clinical samples, youths with bipolar disorder commonly have a complex constellation of psychiatric symptoms. Young people, especially children (11,12), diagnosed as having bipolar disorder frequently also receive diagnoses of disruptive behavior disorders. Anxiety disorders (13), other mood disorders (12,13–15), and psychotic symptoms (16) are also frequently present. Patients treated for bipolar disorder commonly receive complex pharma-

Dr. Olfson is affiliated with the Department of Psychiatry, Columbia University, New York State Psychiatric Institute, 1051 Riverside Dr., New York, NY 10032 (e-mail: mo49@columbia.edu). Dr. Crystal and Dr. Huang are with the Institute for Health, Health Care Policy, and Aging Research, and Dr. Gerhard is with the Ernest Mario School of Pharmacy, both at Rutgers University, New Brunswick, New Jersey. Dr. Carlson is with the Department of Psychiatry and Behavioral Medicine, Stony Brook University School of Medicine, Stony Brook, New York.

ecological regimens (3,17). Temporal relationships between comorbid clinical diagnoses and psychotropic medication prescriptions, however, remain poorly described in the community treatment of young people who have been diagnosed as having bipolar disorder.

Treatment guidelines for youths with bipolar disorder recommend that pharmacological treatment continue for at least one to two years after symptom remission (18). This recommendation is supported by the high relapse rates among youths with narrowly defined mania (11) and bipolar spectrum disorders (16). Yet the duration of actual treatment episodes for juvenile bipolar disorder in community practice is not known.

In this study we examined service patterns surrounding new clinical diagnoses of bipolar disorder among young people. Pharmacological treatments and clinical diagnoses given during the year before and the year after a new diagnosis of bipolar disorder are described, and variations among patients are characterized according to the frequency of bipolar diagnoses in the year after the index diagnosis. These analyses were guided by four hypotheses. First, a clinical diagnosis of bipolar disorder will be more common among adolescents than among children. Second, a diagnosis of bipolar disorder will be associated with a prior diagnosis of depressive disorder among adolescents and a prior diagnosis of disruptive behavior disorder among children. Third, youths who receive more frequent diagnoses of bipolar disorder after the index diagnosis will have had more intensive mental health service use during the year before the index diagnosis. Finally, a clinical diagnosis of bipolar disorder will be followed by increased use of mood stabilizers and antipsychotic medications, decreased use of antidepressants and stimulants or atomoxetine, and a decrease in diagnoses of depressive disorder and disruptive behavior disorder.

Methods

Data source

Service and pharmacy claims were examined from the MarketScan Research Databases (2003–2006). They

include information from over 27 million privately insured individuals and their family members from over 150 employers (19). Deidentified data were used for this study and have been determined to be exempt from human subjects review by the institutional review boards of New York State Psychiatric Institute and Rutgers University.

Patient selection

Selection of patients with a new diagnosis of bipolar disorder occurred in several stages. Patients with a claim for a new diagnosis of bipolar disorder (*ICD-9-CM*: 296.0 or 296.4–296.8) between April 1, 2004, and March 31, 2005, were first selected. Selected patients had not received any listed diagnosis of bipolar disorder during the year before the index visit for bipolar disorder (prediagnosis period) and were continuously eligible for services for at least one year before and after the new diagnosis of bipolar disorder. The sample was limited to patients who were aged 17 years and younger.

A comparison group without a diagnosis of bipolar disorder was then selected from the same population during the same period; the same selection criteria were used for eligibility and age. These patients had no claims for bipolar disorder during the year before and after the date of their first service claim within the recruitment period.

Rates and predictors of a new diagnosis of bipolar disorder

For the analysis of rates and predictors of a new diagnosis of bipolar disorder, patients in the study were characterized by age (younger than seven years, seven to 12 years, and 13 to 17 years), sex, and treatment for mental disorders (*ICD-9-CM*: 290–319) during the year before the index diagnosis. Claims for other mental disorders were categorized as being for disruptive behavior disorder (312, 312.9, 313.81, and 314.), pervasive developmental disorder and psychotic disorder (295, 297, 298, and 299), depressive disorder (293.83, 296.2, 296.3, 296.90, 300.4, 311, and 301.13), anxiety disorder (293.84, 309.81, 300.0, 300.2, 300.3, 308.3, and 309.21), adjustment disorder (309, except 309.21

and 309.81), or other mental disorder (290–319, not classified above). These groups were not mutually exclusive. Among patients with a diagnosis of disruptive behavior disorder, a subgroup was defined for those with at least one diagnosis of attention-deficit hyperactivity disorder (ADHD) (*ICD-9-CM*: 314) but no other diagnoses of disruptive behavior disorders.

Patients were also classified by filled prescriptions for stimulants or atomoxetine, antidepressants, antipsychotics, anxiolytics or hypnotics, or mood stabilizers. Mood stabilizers included lithium, carbamazepine, divalproex sodium, valproic acid, valproate sodium, gabapentin, lamotrigine, oxcarbazepine, and topiramate in the absence of a seizure disorder (*ICD-9-CM*: 345).

Rates of bipolar disorder diagnosis per 100 patients from the combined study and comparison groups with surrounding 99% confidence intervals were determined overall and stratified by sex, age group, presence of a comorbid mental disorder, and psychotropic medication prescribed in the year before the index diagnosis. One logistic regression model was fit to predict a new diagnosis of bipolar disorder, controlling for all covariates. Separate chi square analyses compared the proportion of males and females and the proportion of children (0 to 12 years) and adolescents (13 to 17 years) treated for each mental disorder and psychotropic medication class in the year before the index diagnosis.

Background characteristics of bipolar diagnosis groups

Three subgroups were defined by number of insurance claims for bipolar disorder starting with the index diagnosis. The incidental diagnosis group included patients having only the index claim, the sporadic diagnosis group had one to three additional claims, and the consistent diagnosis group had four or more additional bipolar claims.

Separate variables indicated whether patients received any inpatient or emergency treatment for mental disorders (primary or first listed *ICD-9-CM*: 290–319) or psychotherapy visits (CPT: 90804–90829, 90841–90847,

90849, 90853, 90855, 90857, 90875, and 90876) during the year before the index diagnosis.

The three subgroups (incidental, sporadic, and consistent) were compared with respect to age, sex, mental disorder diagnosis, and psychotropic prescriptions during the year before the new diagnosis of bipolar disorder. In these analyses, one or more prescription or diagnosis claims during this period were used to classify medication use and clinical diagnoses, respectively.

Mental health services before and after the new diagnosis

Filled psychotropic prescriptions and claims for mental disorders were compared across the incidental, sporadic, and consistent diagnosis groups. Using a criterion of two filled prescriptions claims during each one-

year period to focus on substantial medication treatment episodes, each case was classified as no medication use in either year, use in the year before the index diagnosis only, use in the year after the index diagnosis only, or use in both years. Similar classifications were used for claims for mental disorders during the pre- and postdiagnosis periods. Chi square analyses were used to measure associations involving categorical dependent variables across bipolar diagnosis groups. Given the large samples, alpha was set at .01 (two-tailed).

Results

Rates of a new diagnosis of bipolar disorder

As shown in Table 1, the annual rate of new clinical bipolar diagnosis was .23% (2,907 of 1,274,726 youths). Males and females had similar rates,

although females had significantly greater odds of a new diagnosis of bipolar disorder in the multivariate model. Rates of a new diagnosis of bipolar disorder increased with patient age, and among children younger than 13 years, a new diagnosis was significantly more common among boys (.13%, 99% confidence interval [CI]=.11%-.14%) than among girls (.08%, CI=.07%-.09%). Among adolescents, however, a new diagnosis of bipolar disorder was significantly more common among girls (.50%, CI=.46%-.54%) than among boys (.39%, CI=.36%-.42%) (data not shown).

After the analysis controlled for all of the covariates, patients diagnosed as having a depressive disorder or treated with a mood stabilizer in the year before the index diagnosis were more likely than those not so diagnosed or treated to receive a new diagnosis of

Table 1

Rates and predictors of receiving a new diagnosis of bipolar disorder among privately insured youths^a

Variable	Total N	New diagnosis of bipolar disorder		Rate of new diagnosis		Logistic regression ^b	
		N	%	%	99% CI	AOR	99% CI
Total	1,274,726	2,907	100	.23	.22-.24	—	
Sex							
Male	650,873	1,450	49.9	.22	.21-.24	1.0	
Female	623,853	1,457	50.1	.23	.22-.25	1.2	1.1-1.4
Age at the time of the new diagnosis							
<7	360,168	131	4.5	.04	.03-.04	.2	.2-.3
7-12	450,914	722	24.8	.16	.14-.18	.6	.5-.7
13-17	463,644	2,054	70.7	.44	.42-.47	1.0	
Mental disorder diagnosed in the year before the new diagnosis ^c							
Any	88,936	2,232	76.8	2.51	2.37-2.65	—	
Disruptive behavior disorder	44,672	1,066	36.7	2.39	2.20-2.57	3.3	2.9-3.9
Attention-deficit hyperactivity disorder only	39,716	790	27.2	1.99	1.81-2.17	—	
Other disruptive behavior disorder	4,956	276	9.5	5.57	4.71-6.43	—	
Pervasive developmental or psychotic disorder	3,660	174	6.0	4.75	3.83-5.68	1.3	1.0-1.7
Depressive disorder	16,042	1,352	46.5	8.43	7.84-9.02	8.4	7.3-9.6
Anxiety disorder	10,492	377	13.0	3.59	3.12-4.07	1.4	1.2-1.7
Adjustment disorder	16,199	408	14.0	2.52	2.20-2.84	2.0	1.7-2.3
Other mental disorder	18,493	563	19.4	3.04	2.71-3.37	2.0	1.7-2.4
Psychotropic medication prescribed in the year before the new diagnosis							
Stimulant or atomoxetine	58,649	959	33.0	1.64	1.50-1.77	1.2	1.0-1.4
Antidepressant	28,564	1,409	48.5	4.93	4.59-5.27	2.3	2.0-2.7
Antipsychotic	6,368	846	29.1	13.29	12.11-14.46	3.9	3.3-4.6
Mood stabilizer	5,794	923	31.8	15.93	14.58-17.28	11.2	9.6-12.9
Lithium	431	193	6.6	44.78	36.48-53.08	—	
Anxiolytic or hypnotic	8,472	269	9.3	3.18	2.68-3.67	1.3	1.1-1.7

^a Data source: MarketScan

^b Single model controlling for all listed covariates

^c Reference group: those without the indicated diagnosis or those not filling prescriptions for the indicated medication

bipolar disorder. Other significant, although weaker, predictors included a diagnosis of disruptive behavior, anxiety, adjustment, and “other mental” disorders and prescriptions of antipsychotics, antidepressants, and anxiolytics or hypnotics (Table 1). Nearly 2.0% of youths treated for ADHD received a new diagnosis of bipolar disorder. By contrast, nearly one-half (44.8%) of youths treated with lithium received a new diagnosis of bipolar disorder during that period.

Treatment of a new bipolar disorder, by patient sex and age

Among youths with a new diagnosis of bipolar disorder, males were significantly more likely than females to have been treated for disruptive behavior and pervasive developmental or psychotic disorders and to have filled prescriptions for stimulants or atomoxetine, antipsychotics, or mood stabilizers in the year before the index diagnosis. They were less likely to be treated for anxiety, adjustment, depressive, or “other” mental disorders and were less frequently filled prescriptions for antidepressants during this period (Table 2).

Children were significantly more likely than adolescents to have been treated for a disruptive behavior disorder, including ADHD, and to have received stimulants or atomoxetine and antipsychotic medications in the year before the index diagnosis, but they were less likely to have been treated for a depressive disorder or “other” mental disorders (Table 2). They were also less likely than adolescents to be treated with antidepressants or anxiolytics or hypnotics during this period. The two age groups were approximately equally likely to be treated with mood stabilizers.

Bipolar diagnosis subgroups

Among youths with a new diagnosis of bipolar disorder, 28.8% received only the index bipolar diagnosis (incidental diagnosis group); 28.7% received the diagnosis two to four times (sporadic diagnosis group); and 42.5% received the diagnosis five or more times (consistent diagnosis group). Compared with the sporadic bipolar diagnosis group, the consistent diagnosis group included slightly, although significantly, more females (Table 3). The three diagnosis groups did not significantly

differ with respect to mean±SD number of mental disorder visits for diagnoses other than bipolar disorder during the year after the index visit (mean: incidental, 10.7±12.4; sporadic, 10.1±11.2; consistent, 10.6±11.5).

During the prediagnosis year, approximately one-half (52.4%) of adolescents had been diagnosed as having a depressive disorder and a majority had filled a prescription for a psychotropic medication, most commonly an antidepressant (Table 2). During this period, most children with a new diagnosis of bipolar disorder had been diagnosed as having a disruptive behavior disorder and most had filled a prescription for psychotropic medication, usually a stimulant (Table 2).

Mental disorder diagnoses after a new diagnosis of bipolar disorder

Compared with the incidental diagnosis group, the consistent diagnosis group was more likely to have two or more claims for a diagnosis of pervasive developmental or psychotic disorder in the year after the index diagnosis. The consistent diagnosis group was also more likely than the incidental diagnosis group to have two or more

Table 2

Clinical characteristics of privately insured youths in the year before a new diagnosis of bipolar disorder, by sex and age^a

Variable	Males (N=1,450)		Females (N=1,457)		χ^2 ^b	p	Children (0–12 years) (N=853)		Adolescents (13–17 years) (N=2,054)		χ^2 ^b	p
	N	%	N	%			N	%	N	%		
Mental disorder	1,110	76.6	1,122	77.0	.1	.77	675	79.1	1,557	75.8	3.7	.05
Disruptive behavior disorder	680	46.9	386	26.5	130.3	<.001	445	52.2	621	30.2	124.9	<.001
Attention-deficit hyperactivity disorder, only	528	36.4	262	18.0	124.8	<.001	359	42.1	431	21.0	135.6	<.001
Other disruptive behavior disorder	152	10.5	124	8.5	3.3	.07	86	10.1	190	9.3	.5	.49
Pervasive developmental or psychotic disorder	114	7.9	60	4.1	18.1	<.001	45	5.3	129	6.3	1.1	.30
Depressive disorder	565	39.0	787	54.0	66.2	<.001	275	32.2	1,077	52.4	98.8	<.001
Anxiety disorder	155	10.7	222	15.2	13.3	<.001	119	14.0	258	12.6	1.0	.31
Adjustment disorder	172	11.9	236	16.2	11.3	<.001	130	15.2	278	13.5	1.5	.23
Other mental disorder	250	17.2	313	21.5	8.4	.004	111	13.0	452	22.0	31.2	<.001
Psychotropic class	1,040	71.7	993	68.2	4.4	.04	591	69.3	1,442	70.2	.2	.62
Stimulant or atomoxetine	627	43.2	332	22.8	137.5	<.001	394	46.2	565	27.5	95.2	<.001
Antidepressant	628	43.3	781	53.6	30.8	<.001	333	39.0	1,076	52.4	43.0	<.001
Antipsychotic	504	34.8	342	23.5	44.9	<.001	288	33.8	558	27.2	12.7	<.001
Mood stabilizer	501	34.6	422	29.0	10.5	.001	270	31.7	653	31.8	.01	.94
Lithium	117	8.1	76	5.2	9.5	.002	45	5.3	148	7.2	3.6	.06
Anxiolytic or hypnotic	119	8.2	150	10.3	3.8	.05	53	6.2	216	10.5	13.3	<.001

^a Data source: MarketScan. Ages are from the time of the new diagnosis.

^b df=1

Table 3

Demographic traits and clinical characteristics of privately insured youths in the year before a new diagnosis of bipolar disorder, by number of claims with a bipolar disorder diagnosis^a

Variable	Incidental (1 diagnosis) (N=838)		Sporadic (2–4 diagnoses) (N=833)		Consistent (≥5 diagnoses) (N=1,236)		χ^2 ^b	p
	N	%	N	%	N	%		
Sex								
Male ^c	423	50.5	447	53.7	580	46.9	9.2	.01
Female ^d	415	49.5	386	46.3	656	53.1	9.2	.01
Age at the time of new diagnosis								
<7	32	3.8	38	4.6	61	4.9	1.5	.48
7–12	195	23.3	221	26.5	306	24.8	2.4	.30
13–17	611	72.9	574	68.9	869	70.3	3.4	.19
Mental disorder diagnosed in the year before the new diagnosis	631	75.3	644	77.3	957	77.4	1.5	.48
Disruptive behavior disorder	288	34.4	315	37.8	463	37.5	2.7	.26
Attention-deficit hyperactivity disorder only	215	25.7	232	27.9	343	27.8	1.4	.50
Other disruptive behavior disorder	73	8.7	83	10.0	120	9.7	0.9	.64
Pervasive developmental or psychotic disorder	51	6.1	52	6.2	71	5.7	0.2	.89
Depressive disorder	380	45.4	383	46.0	589	47.7	1.2	.55
Anxiety disorder	101	12.1	105	12.6	171	13.8	1.5	.46
Adjustment disorder	110	13.1	119	14.3	179	14.5	0.8	.66
Other mental disorder	164	19.6	164	19.7	235	19.0	0.2	.92
Psychotropic medication prescribed in the year before the new diagnosis	567	67.7	590	70.8	876	70.9	2.9	.24
Stimulant or atomoxetine	264	31.5	262	31.5	433	35.0	4.1	.13
Antidepressant	400	47.7	397	47.7	612	49.5	0.9	.62
Antipsychotic	230	27.4	258	31.0	358	29.0	2.5	.28
Mood stabilizer	237	28.3	277	33.3	409	33.1	6.5	.04
Lithium	46	5.5	56	6.7	91	7.4	2.8	.24
Anxiolytic or hypnotic	72	8.6	76	9.1	121	9.8	0.9	.65
Mental health service received in the year before the new diagnosis								
Inpatient mental health care	82	9.8	89	10.7	149	12.1	2.8	.25
Emergency mental health care	86	10.3	94	11.3	151	12.2	1.9	.39
Psychotherapy	408	48.7	423	50.8	667	54.0	5.8	.05

^a Data source: MarketScan

^b df=2

^c Proportion of sporadic diagnosis group significantly larger than proportion of consistent diagnosis group

^d Proportion of consistent diagnosis group significantly larger than proportion of sporadic diagnosis group

claims for depressive disorder during the prediagnosis year (Table 4).

Psychotropic medication use after a new diagnosis of bipolar disorder

Using a criterion of prescriptions on two or more occasions, we found that youths in the consistent diagnosis group were significantly more likely than those in the other two groups to start psychotropic medications in the year after the new diagnosis of bipolar disorder and less likely than those in the incidental diagnosis group to stop psychotropic medications that they had previously received (Table 5). Starting antipsychotic medications and mood stabilizers after the new diagno-

sis of bipolar disorder was most common in the consistent diagnosis group, followed by the sporadic diagnosis group and then the incidental diagnosis group. Patients in the consistent diagnosis group were also significantly more likely than those in the incidental diagnosis group to start taking antidepressants, stimulants or atomoxetine, and anxiolytics or hypnotics during the year after the new diagnosis of bipolar disorder (Table 5).

Discussion

During the course of one year, an estimated .23% of youths in this large privately insured population received a new clinical diagnosis of bipolar dis-

order. Although we are unable to address how the diagnosis of bipolar disorder in community practice compares with a rigorous application of *DSM-IV* criteria, most young people in our study who were given a new diagnosis of bipolar disorder had already been diagnosed as having other mental disorders, usually depressive or disruptive behavior disorders, and they were already being treated with psychotropic medications. In the year after the new diagnosis of bipolar disorder, more than half had three or fewer additional claims for bipolar disorder. This service pattern suggests that a new diagnosis of bipolar disorder tends to be given to young

people with clinically recognized mental disorders rather than de novo and that the diagnostic label often does not persist, presumably as new clinical developments unfold. The observation that claims for other psychiatric disorders tend to precede claims for a new diagnosis of bipolar disorder may reflect the findings from prospective epidemiological research that several psychiatric disorders, including major depressive, conduct, and oppositional defiant disorders, commonly antedate mania onset (20). More generally, problems in child social, behavioral, and emotional development are often reported before full criteria are met for bipolar disorder (21,22).

Consistent with our hypotheses, the risk of receiving a new diagnosis of bipolar disorder increased with patient age. Also in keeping with our expectations, a clinical diagnosis of disruptive behavior disorder often preceded a diagnosis of bipolar disorder among children. Also, among children, boys were more likely than girls to have a diagnosis of bipolar disorder. Depressive diagnoses often preceded a diagnosis of bipolar disorder among adolescents, and among adolescents, females were more likely than males to be diagnosed as having a depressive disorder before receiving a new diagnosis of bipolar disorder. This pattern of clinical diagnosis may reflect previously described patterns in the age-related treated prevalence of disruptive behavior and mood disorders (23) through childhood and adolescence (24) along with the usual gender distribution in behavior and mood disorders.

Most young people filled prescriptions for psychotropic medications during the year before a new diagnosis of bipolar disorder. Antipsychotics, which are commonly used to treat bipolar disorder among youths (3), were often prescribed to young people during the year before the index diagnosis, especially to children and males of both age groups. Nearly one-third of the youths and proportionately more males than females who were newly diagnosed as having bipolar disorder were already receiving mood stabilizers. These prescription patterns indicate that a diagnosis of bipolar

Table 4

Comorbid mental disorder diagnoses of privately insured youths in the year before and after a new diagnosis of bipolar disorder, by number of claims with a new bipolar disorder diagnosis^a

Variable	Incidental (1 diagnosis) (N=838)		Sporadic (2–4 diagnoses) (N=833)		Consistent (≥5 diagnoses) (N=1,236)	
	N	%	N	%	N	%
Any mental disorder						
No diagnosis in either year ^b	199	23.7	167	20.0	198	16.0
Diagnosis only in the year before ^c	116	13.8	127	15.2	232	18.8
Diagnosis only in the year after	108	12.9	121	14.5	193	15.6
Diagnosis in both years	415	49.5	418	50.2	613	49.6
Disruptive behavior disorders						
No diagnosis in either year	572	68.3	526	63.1	762	61.7
Diagnosis only in the year before	73	8.7	89	10.7	154	12.5
Diagnosis only in the year after	66	7.9	77	9.2	135	10.9
Diagnosis in both years	127	15.2	141	16.9	185	15.0
Depressive disorder						
No diagnosis in either year ^b	464	55.4	446	53.5	586	47.4
Diagnosis only in the year before ^c	99	11.8	118	14.2	204	16.5
Diagnosis only in the year after	92	11.0	104	12.5	171	13.8
Diagnosis in both years	183	21.8	165	19.8	275	22.2
Anxiety disorder						
No diagnosis in either year	743	88.7	726	87.2	1,081	87.5
Diagnosis only in the year before	30	3.6	33	4.0	57	4.6
Diagnosis only in the year after	42	5.0	44	5.3	57	4.6
Diagnosis in both years	23	2.7	30	3.6	41	3.3
Adjustment disorder						
No diagnosis in either year	728	86.9	717	86.1	1,067	86.3
Diagnosis only in the year before	39	4.7	48	5.8	83	6.7
Diagnosis only in the year after	30	3.6	28	3.4	39	3.2
Diagnosis in both years	41	4.9	40	4.8	47	3.8
Pervasive developmental or psychotic disorders						
No diagnosis in either year	795	94.9	775	93.0	1,149	93.0
Diagnosis only in the year before	8	1.0	12	1.4	18	1.5
Diagnosis only in the year after ^c	15	1.8	25	3.0	54	4.4
Diagnosis in both years	20	2.4	21	2.5	15	1.2
Other mental disorder						
No diagnosis in either year	715	85.3	686	82.4	994	80.4
Diagnosis only in the year before	46	5.5	42	5.0	72	5.8
Diagnosis only in the year after	51	6.1	72	8.6	127	10.3
Diagnosis in both years	26	3.1	33	4.0	43	3.5

^a Data source: MarketScan. Classifications based on two or more diagnoses during the year before or after the new diagnosis of bipolar disorder

^b Proportion of incidental diagnosis group significantly larger than proportion of consistent diagnosis group

^c Proportion of consistent diagnosis group significantly larger than proportion of incidental diagnosis group

lar disorder is often given to young people who have been previously identified with and treated for serious mental health problems.

We had anticipated that during the year before the index bipolar diagnosis, patients who had more frequent (consistent) diagnoses of bipolar disorder would have experienced more intensive mental health service use, higher rates of other psychiatric disorder diagnoses, and more complex

medication patterns, compared with patients with less frequent insurance claims for bipolar disorder. The groups in fact had generally similar service patterns during the prediagnosis year. Without more detailed information, including symptom patterns, psychiatric history, family history, and other clinical considerations, it was not possible to predict frequency of visits for the treatment of bipolar disorder among youths with a new di-

Table 5

Psychotropic medication use among privately insured youths in the year before and after a new diagnosis of bipolar disorder, by number of claims with a bipolar disorder diagnosis^a

Variable	Group A: incidental(1 diagnosis) (N=838)		Group B: sporadic (2–4 diagnoses) (N=833)		Group C: consistent (≥5 diagnoses) (N=1,236)		Significant group difference
	N	%	N	%	N	%	
Any psychotropic							
No use in either year	200	23.9	136	16.3	120	9.7	A>B>C
Year before new bipolar diagnosis only	83	9.9	54	6.5	35	2.8	A>B>C
Year after new bipolar diagnosis only	137	16.3	181	21.7	348	28.2	C>A, C>B
Both years	418	49.9	462	55.5	733	59.3	C>A
Mood stabilizer							
No use in either year	533	63.6	417	50.1	393	31.8	A>B>C
Year before new bipolar diagnosis only	51	6.1	34	4.1	40	3.2	A>C
Year after new bipolar diagnosis only	116	13.8	202	24.2	520	42.1	C>B>A
Both years	138	16.5	180	21.6	283	22.9	C>A
Antidepressant							
No use in either year	396	47.3	363	43.6	465	37.6	A>C
Year before new bipolar diagnosis only	102	12.2	119	14.3	153	12.4	
Year after new bipolar diagnosis only	112	13.4	136	16.3	242	19.6	C>A
Both years	228	27.2	215	25.8	376	30.4	
Antipsychotic							
No use in either year	556	66.4	457	54.9	536	43.4	A>B>C
Year before new bipolar diagnosis only	50	6.0	43	5.2	46	3.7	
Year after new bipolar diagnosis only	99	11.8	168	20.2	425	34.4	C>B>A
Both years	133	15.9	165	19.8	229	18.5	
Stimulant or atomoxetine							
No use in either year	551	65.8	538	64.6	723	58.5	A>C
Year before new bipolar diagnosis only	75	9.0	57	6.8	104	8.4	
Year after new bipolar diagnosis only	50	6.0	60	7.2	130	10.5	C>A
Both years	162	19.3	178	21.4	279	22.6	
Anxiolytic or hypnotic							
No use in either year	778	92.8	752	90.3	1,086	87.9	A>C
Year before new bipolar diagnosis only	15	1.8	24	2.9	25	2.0	
Year after new bipolar diagnosis only	26	3.1	38	4.6	92	7.4	C>A
Both years	19	2.3	19	2.3	33	2.7	

^a Data source: MarketScan. Classifications based on two or more prescriptions within class during the year before or after the new diagnosis of bipolar disorder

agnosis of bipolar disorder. In one prospective study of well-characterized youths with bipolar disorder, greater initial bipolar symptom severity and rapid cycling as well as older patient age and female gender predicted higher levels of care (25).

Although it is difficult to understand why a young person has one claim as opposed to five or more claims in community practice, it is possible to address the treatment consequences. First, approximately one-third of patients with an incidental diagnosis of bipolar disorder (only the claim for the index diagnosis) did not receive two or more prescriptions of any one class of psychotropic medications in the year after the diagnosis, so they were generally not medicated. This suggests

that whatever was occurring to prompt the diagnosis was likely transient for some children or that perhaps appropriate medication prescriptions were not filled. By contrast, nearly 90% of youths who received consistent bipolar disorder diagnoses (four or more claims after the index diagnosis) received some psychotropic medication treatment in the year after the new clinical bipolar diagnosis. Moreover, prescription patterns were moderately responsive to new bipolar diagnoses. Use of mood stabilizers and antipsychotics, although used with some frequency before the index diagnosis, increased significantly after the index diagnosis, especially in the group with a consistent diagnosis.

We had hypothesized that a new

diagnosis of bipolar disorder would be used by clinicians to explain patient symptoms and would lead to a decrease in other psychiatric diagnoses and cessation of treatments used to address the previously diagnosed disorders. Specifically, we anticipated that many young people diagnosed as having disruptive behavior disorder or depressive disorder before receiving a new diagnosis of bipolar disorder would not continue to receive these diagnoses after the new diagnosis. However, a substantial proportion of youths continued to receive diagnoses of depressive and disruptive behavior disorder after the new diagnosis of bipolar disorder. Similarly, most youths treated with antidepressants or stimulants or atomoxetine continued to receive

these medications after the new diagnosis of bipolar disorder. This suggests that for many patients, a diagnosis of bipolar disorder is added to the diagnostic list rather than being used as an alternative explanation for the youth's behaviors, and similarly, treatments are added rather than substituted.

We found that around 2% of youths treated for ADHD during the prediagnosis year went on to receive a new diagnosis of bipolar disorder. In one clinical study, which was limited to children with ADHD and moderate to severe impairment, poorer baseline function predicted a change in diagnosis from ADHD to bipolar disorder (26). The disproportionate number of boys treated for ADHD in the year before a new diagnosis of bipolar disorder that we found in our sample raises the possibility that some community clinicians may use a diagnosis of bipolar disorder among boys with particularly severe ADHD.

This study has several limitations. As noted, there is no way to validate the accuracy of diagnosis in this claims database. No information is available concerning onset of psychiatric symptoms or psychiatric disorders. The administrative data also do not measure functional outcomes. For these reasons, it is not possible to draw causal inferences from associations of clinical diagnoses and medications with new onset of bipolar disorder. Associations between prior medication use and a subsequent new diagnosis of bipolar disorder should not be interpreted as evidence that these drugs sensitize patients to developing bipolar disorder. Finally, whether similar service use patterns would be observed among publicly insured or uninsured patients also remains unknown.

Conclusions

Most youths from a large privately insured population with new diagnosis of bipolar disorder received treatment for other mental disorders in the year before the new diagnosis. Among children, symptoms such as impulsivity, hyperactivity, irritability, aggression, and school failure are common to both juvenile bipolar disorder and disruptive be-

havior disorders. Among adolescents, depression also occurs with behaviors that raise questions about whether the condition is a manic or mixed-episode depression or depression with a comorbid condition. Perhaps as a result of diagnostic complexities, clinical diagnoses of bipolar disorder are often given in a tentative manner and do not persist as new symptom patterns emerge or resolve. Administrative requirements to enter diagnoses after each visit, even when the diagnosis is unclear, may further influence clinical diagnosis patterns. Some physicians may be addressing their patients' symptoms with different medications and justifying their use with a diagnosis, whereas others may make a diagnosis based on treatment response. On the basis of medical claims, however, it was not possible to predict which youths would go on to receive a consistent course of bipolar treatment from those whose diagnosis proved transient.

Acknowledgments and disclosures

This work was supported by award U18-HS016097 from the Agency for Healthcare Research and Quality (Center for Education and Research on Mental Health Therapeutics).

Dr. Olfson has received research funding from Eli Lilly and Company and AstraZeneca Pharmaceuticals. Dr. Olfson has also served as a consultant for Pfizer, Janssen, and AstraZeneca Pharmaceuticals. Dr. Carlson has received research funding from and served as a consultant for Otsuka America Pharmaceutical and Bristol-Myers Squibb and has received research funding from GlaxoSmithKline. The other authors report no competing interests.

References

1. Harpaz-Rotem I, Rosenheck RA: Changes in outpatient psychiatric diagnosis in privately insured children and adolescents from 1995 to 2000. *Child Psychiatry and Human Development* 34:329–340, 2004
2. Harpaz-Rotem I, Leslie DL, Martin A, et al: Changes in child and adolescent inpatient psychiatric admission diagnoses between 1995 and 2000. *Social Psychiatry and Psychiatric Epidemiology* 40:642–647, 2005
3. Moreno C, Laje G, Blanco C, et al: National trends in the outpatient treatment of bipolar disorder in youth. *Archives of General Psychiatry* 64:1032–1039, 2007
4. Blader JC, Carlson GA: Increased rates of bipolar disorder diagnoses among US child, adolescent, and adult inpatients, 1996–2004. *Biological Psychiatry* 62:107–114, 2007

5. Holtman M, Bolte S, Poustka F: Rapid increase in rates of bipolar diagnosis in youth: "true" bipolarity of misdiagnosed severe disruptive behavior disorders. *Archives of General Psychiatry* 65:477, 2008
6. Volk HE, Todd RD: Does the child behavior checklist juvenile bipolar disorder phenotype identify bipolar disorder? *Biological Psychiatry* 62:115–120, 2007
7. Pogge DL, Wayland-Smith D, Zaccario M, et al: Diagnosis of manic episodes in adolescent inpatients: structured diagnostic procedures compared to clinical chart diagnoses. *Psychiatry Research* 101:47–54, 2001
8. Correll CU: Antipsychotic use in children and adolescents: minimizing adverse effects to maximize outcomes. *Journal of the American Academy of Child and Adolescent Psychiatry* 47:9–20, 2008
9. McClellan JM: Olanzapine and pediatric bipolar disorder: evidence for efficacy and safety concerns. *American Journal of Psychiatry* 164:1462–1464, 2007
10. Correll CU: Weight gain and metabolic effects of mood stabilizers and antipsychotics in pediatric bipolar disorder: a systematic review and pooled analysis of short-term trials. *Journal of the American Academy of Child and Adolescent Psychiatry* 46:687–700, 2007
11. Geller B, Tillman R, Craney JL, et al: Four-year prospective outcome and natural history of mania in children with a prepubertal and early adolescent bipolar disorder phenotype. *Archives of General Psychiatry* 61:459–467, 2004
12. Biederman J, Faraone SC, Wozniak J, et al: Clinical correlates of bipolar disorder in a large, referred sample of children and adolescents. *Journal of Psychiatric Research* 39:611–622, 2005
13. Findling RL, Gracious BL, McNamara NK, et al: Rapid, continuous cycling and psychiatric co-morbidity in pediatric bipolar I disorder. *Bipolar Disorders* 3:202–210, 2001
14. Birmaher B, Kennah A, Brent D, et al: Is bipolar disorder specifically associated with panic disorder in youths? *Journal of Clinical Psychiatry* 63:414–419, 2002
15. Lewinsohn PM, Klein DN, Seeley JR: Bipolar disorders in a community sample of older adolescents: prevalence, phenomenology, comorbidity, and course. *Journal of the American Academy of Child and Adolescent Psychiatry* 34:454–463, 1995
16. Birmaher B, Axelson D, Strober M, et al: Clinical course of children and adolescents with bipolar spectrum disorders. *Archives of General Psychiatry* 63:175–183, 2006
17. Bhangoo RK, Lowe CH, Myers FS, et al: Medication use in children and adolescents treated in the community for bipolar disorder. *Journal of Child and Adolescent Psychopharmacology* 13:515–522, 2003
18. Kowatch RA, Fristad M, Birmaher B, et al:

- Treatment guidelines for children and adolescents with bipolar disorder: child psychiatric workgroup on bipolar disorder. *Journal of the American Academy of Child and Adolescent Psychiatry* 44:213–235, 2005
19. Adamson DM, Chang S, Hansen LG: White Paper: Health Research Data for the Real World: The MarketScan Databases. Ann Arbor, Mich, Thomson Medstat, July 2006
 20. Kim-Cohen J, Caspi A, Moffitt TE, et al: Prior juvenile diagnoses in adults with mental disorder: developmental follow-back of a prospective-longitudinal cohort. *Archives of General Psychiatry* 60:709–717, 2003
 21. Cannon M, Caspi A, Moffitt TE, et al: Evidence for early-childhood, pan-developmental impairment specific to schizophreniform disorder: results from a longitudinal birth cohort. *Archives of General Psychiatry* 59:449–456, 2002
 22. Fraguas D, de Castro MJ, Medina O: Does diagnostic classification of early-onset psychosis change over follow-up? *Child Psychiatry and Human Development* 39:137–145, 2008
 23. Masi G, Perugi G, Millepiedi S, et al: Developmental differences according to age at onset in juvenile bipolar disorder. *Journal of Child and Adolescent Psychopharmacology* 16:679–685, 2006
 24. Visser SN, Lesesne CA, Perou R: National estimates and factors associated with medication treatment for childhood attention-deficit/hyperactivity disorder. *Pediatrics* 119(suppl 1):S99–S106, 2007
 25. Rizzo CJ, Esposito-Smythers C, Swenson L, et al: Factors associated with mental health service utilization among bipolar youth. *Bipolar Disorders* 9:839–850, 2007
 26. Tillman R, Geller B: Controlled study of switching from attention-deficit/hyperactivity disorder to a prepubertal and early adolescent bipolar I disorder phenotype during 6-year prospective follow-up: rate, risk and predictors. *Development and Psychopathology* 18:1037–1053, 2006

Coming in September

- ◆ **Medication access problems and consequences for “dual eligibles” in Medicare Part D**
- ◆ **Off-label use of antipsychotic medications in the VA system: a national survey**
- ◆ **Public awareness campaigns about depression and suicide: a review**
- ◆ **Consumers with serious mental illness discuss strategies for coping with suicidal thoughts**